

Renumbered Claims

A32000-A (072667.0172)
PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) A recombinant non-yeast DNA encoding a plant protein of interest, wherein an unmodified DNA corresponding to said recombinant non-yeast DNA contains a region having a high content of codons that are poorly suited to for expression in yeasts, wherein ~~a number~~ at least 75% of the codons that are poorly suited to for expression in yeasts are replaced in said region of said recombinant non-yeast DNA with synonymous codons coding for the same amino acid that are well-suited to for expression in yeasts, and wherein the number of replaced codons is sufficient to permit expression of the non-yeast DNA in yeasts.

- ³/~~2~~. (Currently amended) The recombinant non-yeast DNA according to ~~claim 1~~ claims 1 or ²/~~29~~, wherein the poorly suited codons are selected from the group consisting of codons whose frequency of use by yeasts is less than about 13 per 1000 codons.

- ⁵/~~3~~. (Previously presented) The recombinant non-yeast DNA according to claim ³/~~2~~, wherein the poorly suited codons are selected from the group consisting of CTC, CTG and CTT, which encode leucine, CGG, CGC, CGA, CGT and AGG, which encode arginine, GCG and GCC, which encode alanine, GGG, GGC and GGA, which encode glycine, and CCG and CCC, which encode proline.

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4.

(Previously presented) The recombinant non-yeast DNA according to claim⁵~~3~~, wherein the poorly suited codons are selected from the group consisting of CTC and CTG, which encode leucine, CGG, CGC, CGA, CGT and AGG, which encode arginine, GCG and GCC, which encode alanine, GGG and GGC, which encode glycine, and CCG and CCC, which encode proline.

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5.

(Currently amended) The recombinant non-yeast DNA according to ~~claim 1~~ claim³~~2~~, wherein the codons that are well-suited ~~to~~ for expression in yeasts are selected from the group consisting of codons whose frequency of use by yeasts is greater than 15 per 1000 codons.

8
6.

(Previously presented) The recombinant non-yeast DNA according to claim⁷~~5~~, wherein the well-suited codons are selected from the group consisting of TTG and TTA, which encode leucine, AGA, which encodes arginine, GCT and GCA, preferably GCT, which encode alanine, GGT, which encodes glycine, and CCA, which encodes proline.

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7.

(Currently amended) The recombinant non-yeast DNA according to ~~claim 1~~ claim³~~2~~, wherein the region having a high content of codons that are poorly suited ~~to~~ for expression in yeasts contains at least 2 poorly suited codons among 10 consecutive codons, wherein the poorly suited codons are adjacent or nonadjacent to each other.

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8.

(Previously presented) The recombinant non-yeast DNA according to claim⁹~~7~~, wherein the region having a high content of poorly suited codons contains 2, 3, 4, 5 or 6 poorly suited codons per 10 consecutive codons, or contain at least 2 or 3 adjacent poorly suited codons.

13
9.

(Currently amended)

A The recombinant non-yeast DNA ~~eDNA, which encodes~~
~~a plant protein of interest of claim 2,~~ wherein an unmodified DNA corresponding to said recombinant non-yeast DNA contains a region of high CTC codon or high CTC+CTG codon content, wherein a number of said CTC codons and/or CTG codons are replaced in said recombinant non-yeast DNA with TTG and/or TTA codons, and wherein the number of replaced codons is sufficient to permit expression in yeasts.

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10.

(Previously presented)

The recombinant non-yeast cDNA according to claim ¹³9,
wherein the CTC codon(s) and/or the CTG codon(s) are replaced with TTG codon(s).

15
11.

(Previously presented)

The recombinant non-yeast cDNA according to claim ¹³9,
wherein the region having a high content of leucine contains 2, 3, 4, 5 or 6 leucines per 10 consecutive amino acids, or contain at least 2 or 3 adjacent leucines.

12. (Cancelled) ~~The recombinant non-yeast DNA according to claim 1, wherein the general content of poorly suited codons in the corresponding unmodified DNA is at least 20% of the total number of codons.~~

13. (Cancelled) ~~The recombinant non-yeast DNA according to claim 1, wherein replaced codons are in the 5' region.~~

23
14.

(Currently amended)

A The recombinant non-yeast DNA according to claim 13,
encoding a plant protein of interest, wherein an unmodified DNA corresponding to said recombinant non-yeast DNA contains a region having a high content of codons that are poorly suited for expression in yeasts, wherein a number of the codons in the 5' region of the DNA that are poorly suited for expression in yeasts are replaced in said 5' region

of said recombinant non-yeast DNA with synonymous codons coding for the same amino acid that are well- suited for expression in yeasts, wherein the number of replaced codons is sufficient to permit expression in yeasts, wherein replaced codons are only in the 5' region.

15. (Cancelled) ~~The recombinant non-yeast DNA according to claim 1, wherein the corresponding unmodified DNA is a plant DNA.~~

- 11
16. (Currently amended) The recombinant non-yeast DNA according to ~~claim 15~~ ³
claim 2, wherein the corresponding unmodified DNA is selected from the group consisting of a dicotyledonous plant DNA and a monocotyledonous plant DNA.

- 12
17. (Previously presented) The recombinant non-yeast DNA according to ~~claim 16~~ ¹¹,
wherein the corresponding unmodified DNA is selected from the group consisting of a wheat DNA, a barley DNA, an oat DNA, a rice DNA, a maize DNA, a sorghum DNA, and a cane sugar DNA.

- 4
18. (Currently amended) The recombinant non-yeast DNA according to ~~claim 4~~ ³
claim 2, wherein the protein of interest is an enzyme.

- 24
19. (Currently amended) ~~A~~ The recombinant non-yeast DNA according to ~~claim 18~~,
encoding a plant cytochrome P450, in which the non-yeast DNA encoding the plant cytochrome P450 contains a region having a high content of codons that are poorly suited for expression in yeasts, wherein a number of the codons that are poorly suited for expression in yeasts are replaced in said region of said recombinant non-yeast DNA with synonymous codons coding for the same amino acid that are well-suited for expression

in yeasts, such that the number of replaced codons is sufficient to permit expression of the plant cytochrome P450 DNA in yeasts. wherein the enzyme is a cytochrome P450.

²³
~~20.~~ (Previously presented) The recombinant non-yeast DNA according to claim ²⁴~~19~~,
wherein the corresponding unmodified DNA has a nucleotide sequence selected from the
group consisting of SEQ ID NO:1 and SEQ ID NO:10.

²⁴
~~21.~~ (Previously presented) The recombinant non-yeast DNA according to claim ²⁴~~19~~
having a nucleotide sequence selected from the group consisting of SEQ ID NO:7, SEQ
ID NO:8, SEQ ID NO:9, and SEQ ID NO:14.

¹⁶
~~22.~~ (Currently amended) A chimeric gene which comprises a recombinant non-yeast
DNA sequence according to ~~claim 1~~ ³claim ~~2~~ operably linked to heterologous 5' and 3'
regulatory elements which are able to function in a yeast.

¹⁷
~~23.~~ (Previously presented) A yeast transformation vector comprising at least one
chimeric gene according to claim ¹⁶~~22~~.

¹⁸
~~24.~~ (Previously presented) A process for transforming a yeast cell using a vector
according to claim ¹⁷~~23~~ comprising contacting a yeast cell with said vector under
conditions that permit said yeast cell to take up said vector.

¹⁹
~~25.~~ (Previously presented) A transformed yeast for expressing a protein of interest,
comprising the chimeric gene according to claim ¹⁶~~22~~.

²⁰
~~26.~~ (Previously presented) The yeast according to claim ¹⁹~~25~~, ~~wherein it~~ which is
selected from the group consisting of *Saccharomyces*, *Kluyveromyces*, *Hansenula*, *Pichia*

and *Yarrowia*.

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27.

(Currently amended) A process for producing a heterologous protein of interest in a transformed yeast, comprising:

- a) transforming a yeast with a vector which contains a recombinant non-yeast DNA according to ~~claim 1~~ ³ claim 2 operably linked to heterologous 5' and 3' regulatory elements which are able to function in a yeast;
- b) culturing the transformed yeast; and
- c) extracting the protein of interest from the yeast culture.

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28.

(Currently amended) A process for transforming a substrate by ~~enzymic~~ enzymatic catalysis ~~using~~ with an enzyme which is expressed in a yeast comprising:

- a) culturing, in the presence of the substrate to be transformed, ~~the yeast according to claim 25~~ a transformed yeast that expresses a protein of interest, said transformed yeast comprising a chimeric gene, said chimeric gene comprising a recombinant non-yeast DNA encoding a plant protein of interest, wherein an unmodified DNA corresponding to said recombinant non-yeast DNA contains a region having a high content of codons that are poorly suited for expression in yeasts, wherein a number of the codons that are poorly suited to yeasts are replaced in said region of said recombinant non-yeast DNA with synonymous codons coding for

the same amino acid that are well-suited to yeasts, and wherein
the number of replaced codons is sufficient to permit expression
of the non-yeast DNA in yeasts, said chimeric gene being
operably linked to heterologous 5' and 3' regulatory elements
which are able to function in a yeast; and

b) recovering the transformed substrate from the yeast culture.

²
~~29.~~

(New) The recombinant non-yeast DNA of claim 1, wherein 100% of the codons that are poorly suited for expression in yeasts are replaced in said region of said recombinant non-yeast DNA with synonymous codons coding for the same amino acid that are well-suited for expression in yeasts, wherein the number of replaced codons is sufficient to permit expression of the non-yeast DNA in yeasts, and wherein the plant protein of interest is produced.